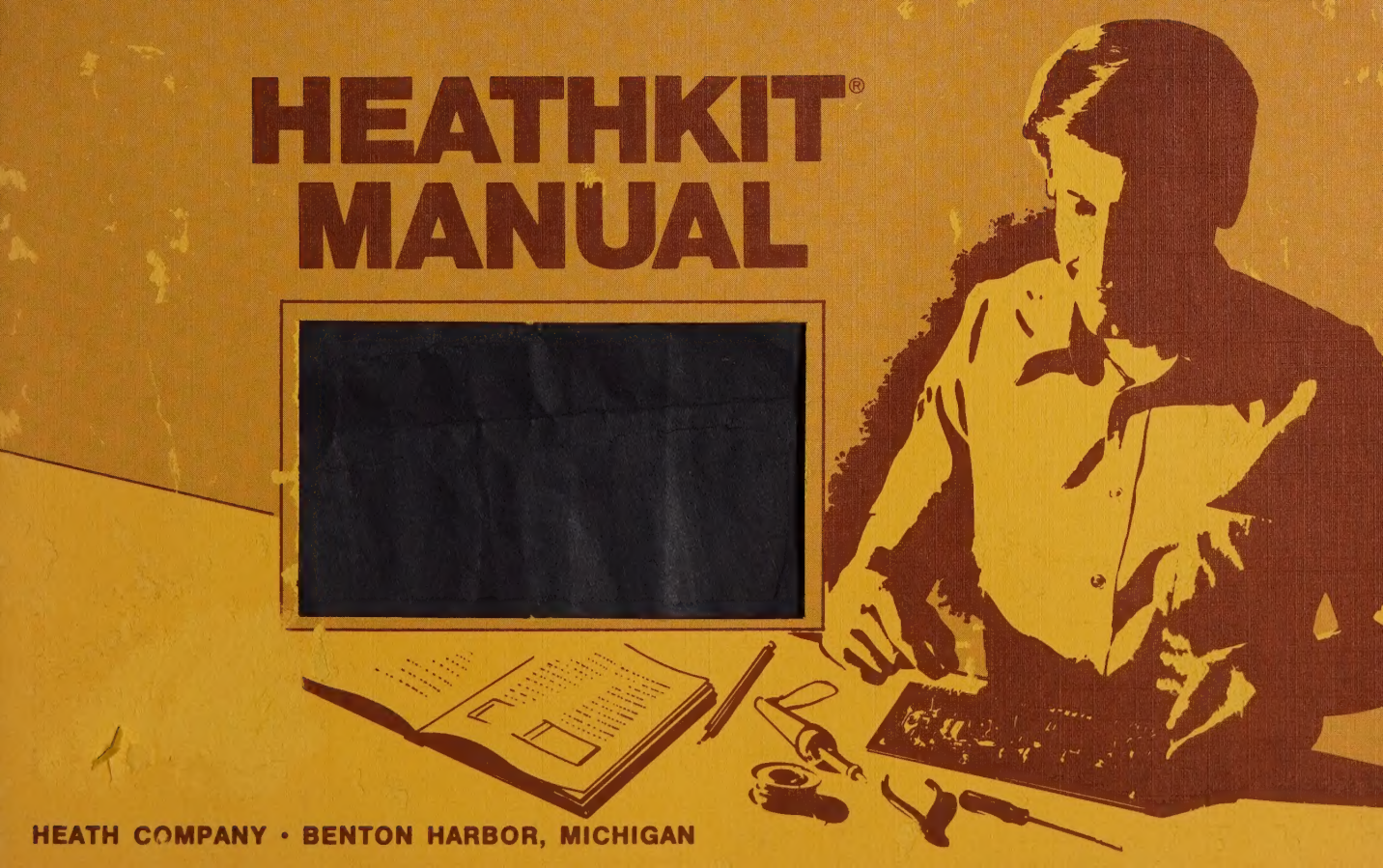
HEATHKIT® MANUAL



HEATH COMPANY • BENTON HARBOR, MICHIGAN

YOUR HEATHKIT 90 DAY LIMITED WARRANTY

If you are not satisfied with our service - warranty or otherwise - or with our products, write directly to our Director of Customer Services, Heath Company, Benton Harbor, Michigan 49022. He will make certain your problems receive immediate, personal attention.

Our attorney, who happens to be quite a kitbuilder himself, insists that we describe our warranty using all the necessary legal phrases in order to comply with the new warranty regulations. Fine. Here they are:

For a period of ninety (90) days after purchase, Heath Company will replace or repair free of charge any parts that are defective either in materials or workmanship. You can obtain parts directly from Heath Company by writing us at the address below or by telephoning us at (616) 982-3571. And we'll pay shipping charges to get those parts to you — anywhere in the world.

We warrant that during the first ninety (90) days after purchase, our products, when correctly assembled, calibrated, adjusted and used in accordance with our printed instructions, will meet published specifications.

If a defective part or error in design has caused your Heathkit product to malfunction during the warranty period through no fault of yours, we will service it free upon proof of purchase and delivery at your expense to the Heath factory, any Heathkit Electronic Center (units of Schlumberger Products Corporation), or any of our authorized overseas distributors.

You will receive free consultation on any problem you might encounter in the assembly or use of your Heathkit product. Just drop us a line or give us a call. Sorry, we cannot accept collect calls.

Our warranty does not cover and we are not responsible for damage caused by the use of corrosive solder, defective tools, incorrect assembly, misuse, fire, or by unauthorized modifications to or uses of our products for purposes other than as advertised. Our warranty does not include reimbursement for customer assembly or set-up time.

This warranty covers only Heathkit products and is not extended to allied equipment or components used in conjunction with our products. **We are not responsible for incidental or consequential damages.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

HEATH COMPANY
BENTON HARBOR, MI. 49022

HEATH COMPANY PHONE DIRECTORY

The following telephone numbers are direct lines to the departments listed:

Kit orders and delivery information	(616) 982-3411
Credit	(616) 982-3561
Replacement Parts	(616) 982-3571

Technical Assistance Phone Numbers
8:00 A.M. to 12 P.M. and 1:00 P.M. to 4:30 P.M., EST, Weekdays Only

R/C, Audio, and Electronic Organs	(616) 982-3310
Amateur Radio	(616) 982-3296
Test Equipment, Weather Instruments and Home Clocks	(616) 982-3315
Television	(616) 982-3307
Aircraft, Marine, Security, Scanners, Automotive, Appliances and General Products	(616) 982-3496
Computers	(616) 982-3309

Prices and specifications subject to change without notice.

Heathkit® Manual

for the

RELATIVE FIELD STRENGTH METER

Model HD-1426

595-1956

HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022

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Printed in the United States of America

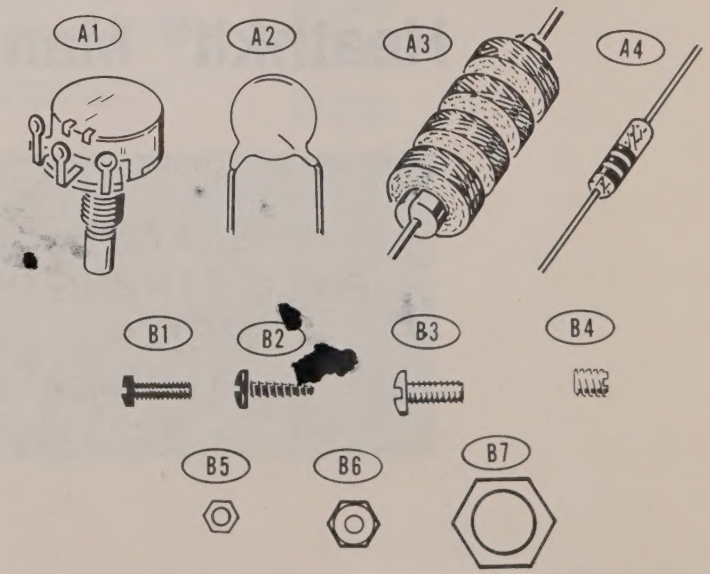
PARTS LIST

ELECTRONIC PARTS

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
A1	10-40	1	100 kΩ control	R1
A2	21-16	1	.01 μF ceramic capacitor	C1
A3	45-4	1	RF choke	RFC1
A4	56-20	1	1N295 diode	D1
	85-1912-1	1	Circuit board	
	407-167	1	Meter	M1

HARDWARE

B1	250-391	2	4-40 × 5/16″ screw
B2	250-1245	4	#4 × 3/8″ sheet metal screw
B3	250-587	1	6-32 × 5/16″ screw
B4	250-16	1	8-32 × 3/16″ setscrew
B5	252-15	2	4-40 nut
B6	252-3	2	6-32 nut
B7	252-7	1	Control nut



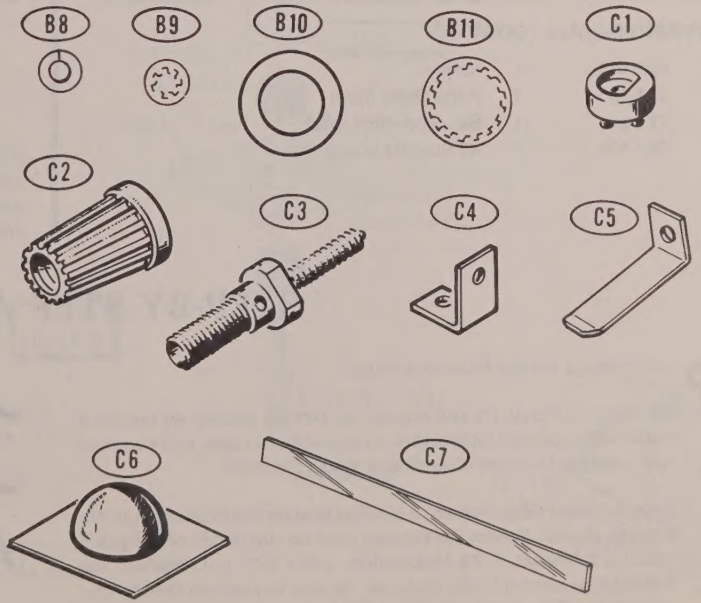
KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.

Hardware (cont'd.)

B8	254-41	2	#4 lockwasher
B9	254-1	3	#6 lockwasher
B10	253-10	1	Control flat washer
B11	254-5	1	Control lockwasher

MISCELLANEOUS

	73-92	1	5″ double-sided tape
C1	75-17	2	Binding post base
C2	100-16-18	1	Binding post cap
C3	427-3	1	Binding post
	95-98	1	Cabinet
	203-1865-1	1	Front panel
	203-1866	1	Rear panel
C4	204-102	1	L-bracket
C5	258-6	2	Spring clip
C6	261-43	4	Foot
	340-11	1′	Bare wire
	344-59	1′	White wire
C7	390-1167	2	Side trim



KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
Miscellaneous (cont'd.)				
	462-138	1	Knob	
	597-260	1	Parts Order Form	
	391-34	1	Blue and white label	
	597-306	1	Kit Builders Guide	
		1	Manual (See Page 1 for part number.)	
			Solder	

To order a replacement part, always include the Part Number and use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, refer to "Customer Service" at the end of this Manual. For prices, refer to the separate "Heath Parts Price List."

STEP-BY-STEP ASSEMBLY

Refer to Pictorial 1 for the following steps.

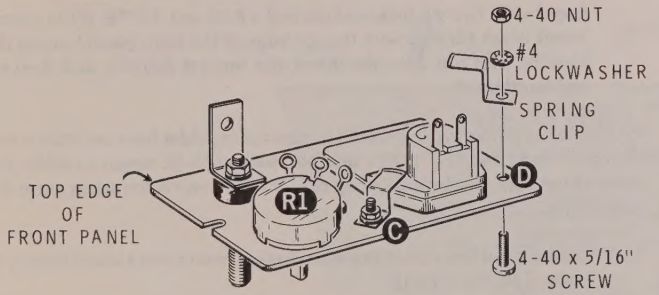
( ) R1: Refer to Detail 1A and mount the 100 kΩ control on the front panel. Use a control lockwasher, a control flat washer, and a control nut. Position the control as shown in the Pictorial.

( ) Refer to Detail 1B and mount a binding post on the front panel in the manner shown. Secure the binding post on the inside of the panel with an L-bracket, a #6 lockwasher, and a 6-32 nut. Position the L-bracket as shown in the Pictorial. Be sure to position the binding post so the flat on the outside of the front panel is parallel to the bottom edge of the panel.

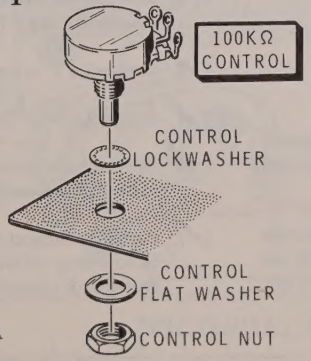
( ) Refer to Detail 1C and bend each of the spring clips as shown. Form the existing bend to 90° as shown.

( ) Loosely mount the two spring clips on the inside of the front panel at C and D. Use 4-40 × 5/16" screws, #4 lockwashers, and 4-40 nuts.

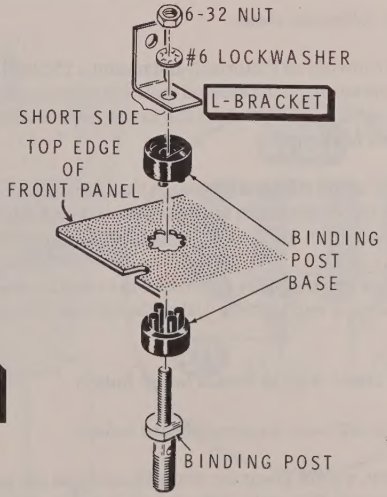
( ) Position the meter into the front panel cutout as shown in the Pictorial. Position the two spring clips over the rear of the meter; then tighten the spring clip mounting hardware. Bend the meter lugs as shown. Remove the shorting wire (if any) from the meter lugs.



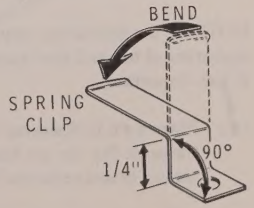
PICTORIAL 1



Detail 1A



Detail 1B



Detail 1C

Refer to Pictorial 2 for the following steps.

( ) D1: Refer to the inset drawing on Pictorial 2 and mount a 1N295 diode at D1 as shown. Be sure to match the banded end of the diode with the band outline on the circuit board. Solder the diode leads to the foil and cut off the excess lead lengths.

( ) RFC1: Push the leads of the RF choke through the indicated circuit board holes. Position the choke down onto the board; then solder the leads to the circuit board foil and cut off the excess lead lengths.

NOTE: In the following steps when you are instructed to install a wire, cut the wire to the indicated length and remove 1/4" of insulation from each wire end.

( ) Solder one end of a 1-3/4" wire to circuit board hole A.

( ) Solder one end of a 2-1/2" wire to circuit board hole B.

NOTE: In the following step, do **not** grasp the circuit board and the panel and attempt to bend the bracket. The angle of the circuit board to the panel is not important.

( ) Place a #6 lockwasher onto a 6-32 × 5/16" screw and push the screw through the circuit board from the copper-etched side. Mount the circuit board onto the binding post L-bracket; then secure the circuit board with two #6 lockwashers and a 6-32 nut. NOTE: If the circuit board is not parallel with the top edge of the front panel, loosen the binding post nut, turn the board and bracket slightly, and then re-tighten the nut.

NOTE: In the following steps, (NS) means not to solder because other wires will be added later. "S-" with a number, such as (S-2), means to solder the connection. The number following the "S" tells how many wires are at the connection.

( ) Connect the free end of the wire coming from circuit board hole A to control R1 lug 1 (S-1).

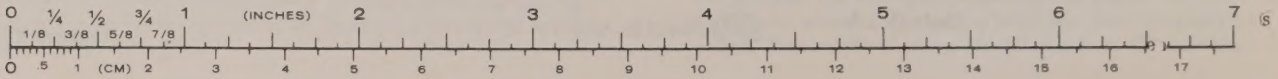
( ) Connect the free end of the wire coming from circuit board hole B to control R1 lug 3 (NS).

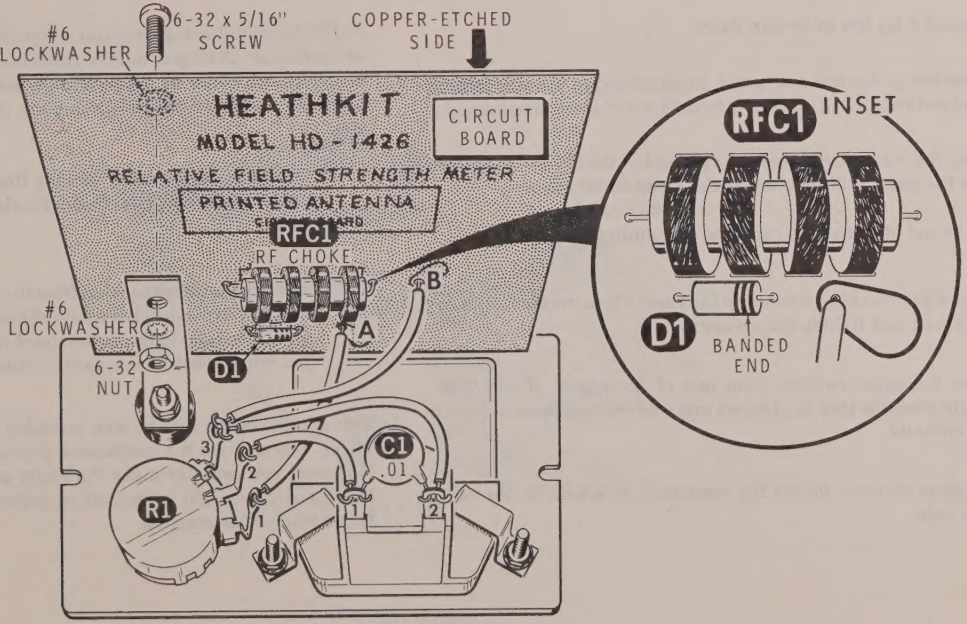
( ) Connect a 2" wire from control R1 lug 2 (S-1) to meter lug 1 (NS).

( ) Connect a 2-3/4" wire from control R1 lug 3 (S-2) to meter lug 2 (NS).

( ) C1: Cut both leads of a .01 μF ceramic capacitor to 3/8". Connect the capacitor between meter lugs 1 (S-2) and 2 (S-2).

( ) Carefully inspect the connections on the front panel components to be sure they are well soldered. Cut off any excess lead or wire lengths. Be sure all circuit board connections are soldered.




#6
LOCKWASHER
6-32 x 5/16"
SCREW
COPPER-ETCHED
SIDE
HEATHKIT
MODEL HD-1426
CIRCUIT
BOARD
RELATIVE FIELD STRENGTH METER
PRINTED ANTENNA
RFC1
RF CHOKE
B
A
#6
LOCKWASHER
6-32
NUT
D1
C1
.01
R1
3
2
1
1
2
RFC1
INSET
D1
BANDED
END

PICTORIAL 2

Refer to Pictorial 3 for the following steps.

( ) Position the perforated rear panel, numbered side inward, into the cabinet and secure it in place with two #4 × 3/8″ sheet metal screws.

( ) Position the front panel into the larger end of the cabinet as shown. Secure the panel with two #4 × 3/8″ sheet metal screws.

( ) Turn the red binding post cap onto the binding post.

( ) Start an 8-32 × 3/16″ setscrew into the knob. Place the knob onto the control shaft and tighten the setscrew.

( ) Remove the paper backing from one of the pieces of side trim. Carefully press the trim in place on one side of the cabinet as shown in the Pictorial.

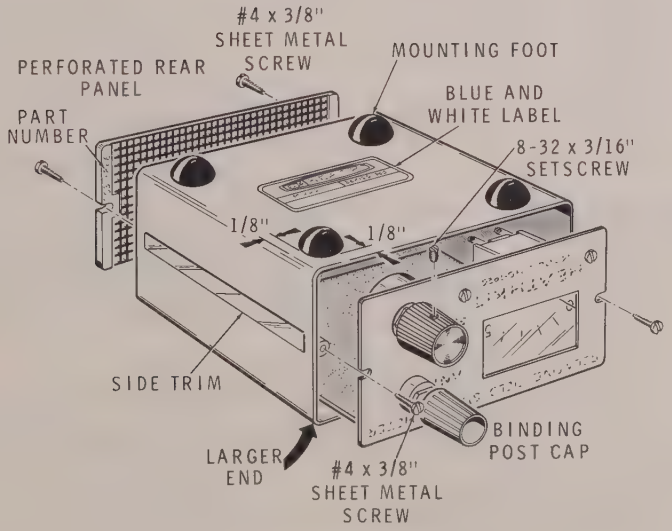
( ) In the same manner, mount the remaining side trim on the other cabinet side.

NOTE: In the following step, you will be instructed to put feet on the bottom of the cabinet. A strip of double-sided tape has been provided if you desire to mount the Meter in some semi-permanent location such as on the instrument panel of a boat or automobile. In such a case, disregard the next step.

( ) Remove the rectangular backing from each of the mounting feet and press the feet in place at the four corners on the underside of the meter cabinet.

( ) Remove the paper backing from the blue and white label. Then press the label in place in the center of the underside of the cabinet. NOTE: Be sure to refer to the Series number and Model number on the blue and white label in any correspondence with the Heath Company.

This completes the step-by-step assembly of your Relative Field Strength Meter. You may use the instrument as is with the built-in antenna feature. However, you can also make the Meter more sensitive by using various lengths of wire to add to the built-in antenna. See the "Operation" section for additional information.


#4 x 3/8" SHEET METAL SCREW
PERFORATED REAR PANEL
MOUNTING FOOT
BLUE AND WHITE LABEL
PART NUMBER
8-32 x 3/16" SETSCREW
1/8"
1/8"
SIDE TRIM
LARGER END
#4 x 3/8" SHEET METAL SCREW
BINDING POST CAP

PICTORIAL 3

OPERATION

Place the Relative Field Strength Meter near your transmitter, or on the dashboard of your vehicle. Set the SENS control at its midpoint of rotation. Then key the transmitter as you observe the meter. Readjust the control until you obtain a midscale indication on the meter.

If you are unable to obtain the desired results, you may move the Meter closer to the antenna, or you may increase the sensitivity of the Meter by adding to the antenna length in any of the following ways:

1. Experiment by connecting various lengths of wire to the binding post. Use the length that gives optimum Meter deflection.

2. Connect a length of hookup wire to the binding post and tape it to a nearby flat surface.

3. Use the 12" heavy bare wire as follows:

   A. Make the wire as straight as you can. Then form a loop in one end.

   B. Connect the other end to the binding post.

In addition to providing a visual indication that your transmitter is radiating a signal, the Meter will also provide an indication that you can use to tune the transmitter to its maximum output.

You may also use the internal antenna etched on the printed circuit board, by itself, with no pickup element connected to the front panel binding post. Note that this etched antenna is somewhat directional, and the meter indication may vary if the unit is moved about. Also, some meter readings will vary when your body comes in close proximity to the pickup antenna.

IN CASE OF DIFFICULTY

1. Carefully check the wiring in your kit. Be sure each wire is routed exactly as shown in the Pictorials.

2. Carefully check each solder connection. Each connection should have a bright, shiny appearance. If you are in doubt about a connection, reheat it and add a small additional amount of solder.

3. Carefully check the foil side of the circuit board to make sure there are no solder "bridges" from one foil to another that could short out the circuit.

NOTE: If you wish to use an ohmmeter to make a continuity check, DO NOT PLACE THE METER DIRECTLY ACROSS THE METER TERMINALS.

4. To check the 100 kΩ control and the meter:

   a) Disconnect diode D1 from point A on the circuit board.

   b) Turn the control knob fully counterclockwise.

c) Place the ohmmeter leads on circuit board foils A and B. The resistance should be approximately 100 kΩ.

d) If you obtain no resistance reading, disconnect either wire going to the meter. Then check the lugs of the 100 kΩ control with the ohmmeter to determine if it is open.

5. To check diode D1, place the ohmmeter leads directly across the leads of the diode. Then reverse the ohmmeter leads. You should obtain diode resistance readings of 100 – 200 Ω and 100 kΩ or higher.

TROUBLESHOOTING CHART

CONDITION	POSSIBLE CAUSE
No meter reading.	1. Transmitter not radiating a signal. 2. Unit incorrectly wired. 3. Poor solder connection(s). 4. Meter open.
Meter pointer moves downward.	1. Diode reversed. 2. Meter wires reversed.
Meter reading too low, SENS control fully clockwise.	1. Pickup antenna too short. 2. Move Field Strength Meter closer to source of radiation.
Meter reading too high, SENS control fully counterclockwise.	1. Control contacts dirty (use contact cleaner). 2. Field Strength Meter too close to radiating source. 3. Pickup antenna too long.

SPECIFICATIONS

Frequency Range	1.8 to 250 MHz.
Meter Sensitivity	150 μA, full scale.
Dimensions	2-3/4" high × 4-1/8" wide × 4-1/4" deep (10.48 × 6.99 × 10.8 cm).
Net Weight	6 oz. (170 gm).

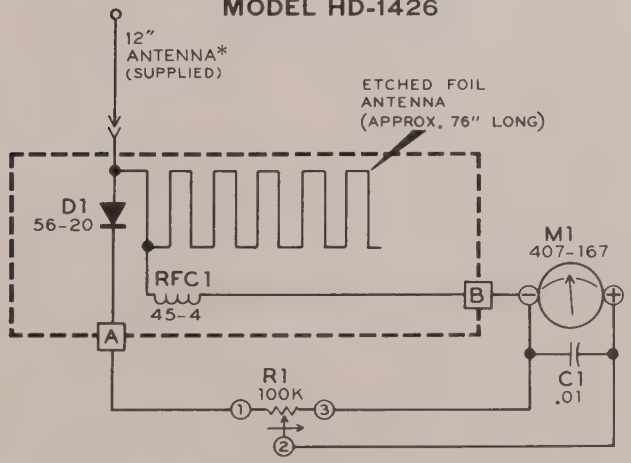
The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

CIRCUIT DESCRIPTION

Refer to the Schematic Diagram as you read the following description of the Relative Field Strength Meter.

Diode D1 rectifies the RF energy picked up by the antenna. SENS control R1 is a shunt-connected variable resistor that keeps the meter on scale. Choke RFC1 is a DC return path for the circuit. Capacitor C1 is a decoupling device.

SCHEMATIC OF THE HEATHKIT® RELATIVE FIELD STRENGTH METER MODEL HD-1426



*NOTE: YOU may use any desirable added wire for increased instrument sensitivity.

CUT ALONG DOTTED LINE

FOR PARTS REQUESTS ONLY

- Be sure to follow instructions carefully.
- Use a separate letter for all correspondence.
- Please allow 10 - 14 days for mail delivery time.

SEND TO:

HEATH COMPANY
BENTON HARBOR
MICHIGAN 49022
ATTN: PARTS REPLACEMENT

Phone (Replacement parts only):
616 982-3571

DO NOT WRITE IN THIS SPACE

INSTRUCTIONS

- Please print all information requested.
- Be sure you list the correct **HEATH** part number exactly as it appears in the parts list.
- If you wish to prepay your order, mail this card and your payment in an envelope. Be sure to include 10% (25¢ minimum, $3.50 maximum) for insurance, shipping and handling. Michigan residents add 4% tax.

Total enclosed $_____

- If you prefer COD shipment, check the COD box and mail this card. COD ☐

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

The information requested in the next two lines is not required when purchasing nonwarranty replacement parts, but it can help us provide you with better products in the future.

Model # _____ Invoice # _____

Date Purchased _____ Location Purchased _____

LIST **HEATH** PART NUMBER	QTY.	PRICE EACH	TOTAL PRICE
TOTAL FOR PARTS			
HANDLING AND SHIPPING			
MICHIGAN RESIDENTS ADD 4% TAX			
TOTAL AMOUNT OF ORDER			

THIS FORM IS FOR U.S. CUSTOMERS ONLY — OVERSEAS CUSTOMERS SEE YOUR DISTRIBUTOR

CUSTOMER SERVICE

REPLACEMENT PARTS

Please provide complete information when you request replacements from either the factory or Heath Electronic Centers. Be certain to include the **HEATH** part number exactly as it appears in the parts list.

ORDERING FROM THE FACTORY

Print all of the information requested on the parts order form furnished with this product and mail it to Heath. For telephone orders (parts only) dial 616 982-3571. If you are unable to locate an order form, write us a letter or card including:

- Heath part number.
- Model number.
- Date of purchase.
- Location purchased or invoice number.
- Nature of the defect.
- Your payment or authorization for COD shipment of parts not covered by warranty.

Mail letters to: Heath Company
Benton Harbor
MI 49022
Attn: Parts Replacement

Retain original parts until you receive replacements. Parts that should be returned to the factory will be listed on your packing slip.

OBTAINING REPLACEMENTS FROM HEATH ELECTRONIC CENTERS

For your convenience, "over the counter" replacement parts are available from the Heath Electronic Centers listed in your catalog. Be sure to bring in the original part and purchase invoice when you request a warranty replacement from a Heath Electronic Center.

TECHNICAL CONSULTATION

Need help with your kit? — Self-Service? — Construction? — Operation? — Call or write for assistance. you'll find our Technical Consultants eager to help with just about any technical problem except "customizing" for unique applications.

The effectiveness of our consultation service depends on the information you furnish. Be sure to tell us:

- The Model number and Series number from the blue and white label.
- The date of purchase.
- An exact description of the difficulty.
- Everything you have done in attempting to correct the problem.

Also include switch positions, connections to other units, operating procedures, voltage readings, and any other information you think might be helpful.

Please do not send parts for testing, unless this is specifically requested by our Consultants.

Hints: Telephone traffic is lightest at midweek — please be sure your Manual and notes are on hand when you call.

Heathkit Electronic Center facilities are also available for telephone or "walk-in" personal assistance.

REPAIR SERVICE

Service facilities are available, if they are needed, to repair your completed kit. (Kits that have been modified, soldered with paste flux or acid core solder, cannot be accepted for repair.)

If it is convenient, personally deliver your kit to a Heathkit Electronic Center. For warranty parts replacement, supply a copy of the invoice or sales slip.

If you prefer to ship your kit to the factory, attach a letter containing the following information directly to the unit:

- Your name and address.
- Date of purchase and invoice number.
- Copies of all correspondence relevant to the service of the kit.
- A brief description of the difficulty.
- Authorization to return your kit COD for the service and shipping charges. (This will reduce the possibility of delay.)

Check the equipment to see that all screws and parts are secured. (Do not include any wooden cabinets or color television picture tubes, as these are easily damaged in shipment. Do not include the kit Manual.) Place the equipment in a strong carton with at least THREE INCHES of *resilient* packing material (shredded paper, excelsior, etc.) on all sides. Use additional packing material where there are protrusions (control sticks, large knobs, etc.). If the unit weighs over 15 lbs., place this carton in another one with 3/4" of packing material between the two.

Seal the carton with reinforced gummed tape, tie it with a strong cord, and mark it "Fragile" on at least two sides. Remember, the carrier will not accept liability for shipping damage if the unit is insufficiently packed. Ship by prepaid express, United Parcel Service, or insured Parcel Post to:

Heath Company
Service Department
Benton Harbor, Michigan 49022

HEATH

Schlumberger

HEATH COMPANY • BENTON H AN

THE WORLD'S FINEST ELECTRONIC E

MP MASTER

MA22808

LITHO IN U.S.A.